2621

Docket No.: 10512-0007-25 DIV

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ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

RE: Application Serial No.: 09/538,493
Applicants: Geoffrey B. RHOADS
Filing Date: March 30, 2000
For: METHODS FOR INSERTING AND DETECTING WATERMARKS IN DIGITAL DATA
Group Art Unit: 2621
Examiner: COUSO, JOSE L.

SIR:

Attached hereto for filing are the following papers:

SUPPLEMENTAL 37 CFR 1.607 REQUEST FOR AN INTERFERENCE WITH A PATENT

Our check in the amount of **$0.00** is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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Docket No. 10512/0007/25DIV

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

Rhoads	:	
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SERIAL NO: 09/538,493	:	GROUP ART UNIT: 2721
	:	
FILED: March 20, 2000	:	EXAMINER: CUOSO, J.
	:	
FOR: METHODS FOR INSERTING AND DETECTING WATERMARKS IN DIGITAL DATA	:	

SUPPLEMENTAL 37 CFR 1.607 REQUEST FOR AN INTERFERENCE WITH A PATENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

In response to the office action dated November 26, 2002, Applicants have applied each limitation or element of claims 58-133 to the disclosure of the above identified application. Applicants note that the support identified is not intended to be limiting to the scope of the claims, nor is it intended to reflect all portions of the specification which provide support for a particular feature.

Claims 58-133 of the Present Application	Application to the Disclosure of the Application
58. A system for pre-analyzing a digital signal for encoding at least one digital watermark using a digital filter comprising:	Page 129 lines 27-31.
a processor for identifying an area of the digital signal that will be affected by the digital filter; and	See page 129 lines 27-31, page 130 lines 2-7, and page 11 lines 18-31.

an encoder for encoding the at least one digital watermark in the digital signal, the encoder encoding the at least one digital watermark so as to avoid the at least one area of the digital signal that will be affected by the digital filter.	See Figure 6.
59. The system of claim 58, wherein the processor operates on the digital signal by selecting an area of the digital signal from the group consisting of a frequency delimited area and a time delimited area.	Page 32 lines 12 and 13.
60. The system of claim 58, wherein the processor operates on the digital signal by selecting an area of the digital signal from a bit-depth delimited area.	Page 129 lines 27-30.
61. The system of claim 58, wherein the encoder ensures that the watermark will survive the changes introduced by the digital filter.	Page 32 lines 3-16.
62. A system for pre-processing a watermark message, comprising: a pre-processor for determining an exact length of a watermark message as it will be encoded; and a key generator for generating a watermark key that provides at least one unique bit for each bit comprising the watermark message.	Figure 6 illustrates an encoding system including a register 216 configured to store an N-bit identification word. See Figure 6, pointer 230, page 5 lines 22-29, and page 27, lines 8-15. Page 23 lines 16 and 17; and page 30 lines 15-19.
63. A system for encoding a watermark in a digital signal, comprising: a generator for generating a plurality of watermark pseudo-random key bits; and an encoder for encoding the watermark in the digital signal using the watermark pseudo-random key bits and characteristics of the digital signal.	Figure 6 illustrates a system for encoding a watermark in an input digital signal 218. Figure 6, pseudo random source 206, and page 33 lines 10-13. See Figure 6, adder/subtracter 212, page 23 line 21 - page 24 line 29, and page 32 lines 3-16.
64. The system of claim 63, wherein the generator is selected from the group consisting of a non-linear generator and a scrambling generator.	See Figure 6 element 206 and page 34 lines 13-24.
65. The system of claim 63, wherein the characteristics of the digital signal comprise	Page 10 lines 3-9.

mathematically defined functions of the digital signal.	
66. A system for encoding a watermark in a digital signal, comprising: a mapper for mapping pseudo-random key and processing state information to effect an encode/decode map using a generator; and an encoder for encoding the watermark in the digital signal using the encode/decode map and characteristics of the digital signal.	See Figure 6 and page 30 lines 15-19. Page 30 lines 15-19 and page 49 lines 26-31. Figure 6, adder/subtracter 212.
67. The system of claim 66, wherein the generator is selected from the group consisting of a non-linear generator and a scrambling generator.	See pseudo random source 206; and page 34 lines 13-24.
68. The system of claim 66, wherein the characteristics of the digital signal comprise mathematically defined functions of the digital signal.	Page 10 lines 3-9.
69. A system for encoding watermarks, comprising: an inverter for inverting at least one instance of the watermark bit stream; and an encoder for encoding at least one instance of the watermark using the inverted instance of the watermark bit stream.	See page 6 line 19 - page 9 line 18. Page 16 line 22 - page 17 line 7. Page 7 line 27 - page 8 line 2.
70. A system for analyzing composite digitized signals for watermarks, comprising: a first receiver for receiving a composite signal; a second receiver for receiving an unwatermarked sample signal; an aligner for time aligning the unwatermarked sample signal with the composite signal; an adjuster for gain adjusting the time aligned unwatermarked sample signal to a corresponding segment of the composite signal, determined when the signals are time aligned;	Page 8 line 3 – page 9 line 18. Page 8 lines 13-20 analysis. Page 8 lines 3-4 and page 8 lines 13-20. Page 25 lines 22-26. Page 25 lines 22-26 disclose registering the suspect signal by scaling the amplitude of the suspect signal relative to the original unwatermarked sample signal.

an estimator for estimating a pre-composite signal using the composite signal and the gain adjusted unwatermarked sample signal;	Page 8 line 27- p age 9 line 3.
an estimator for estimating a watermarked sample signal by subtracting the estimated pre-composite signal from the composite signal; and	Page 8 line 27- p age 9 line 3.
a scanner for scanning the estimated watermarked sample signal for watermarks.	Page 9 lines 4-18 disclose that the result of the subtraction is analyzed for the watermark.
71. A method for pre-analyzing a digital signal for encoding a plurality of digital watermarks using a digital filter, comprising:	Figure 6 and page 23 line 21- page 25 line 3.
providing a digital signal;	See Figure 6, input 218.
providing a plurality of digital watermarks;	Page 24 lines 15-24.
determining an encoding level; and	See Figure 6 first scaler 208 and second scaler 210.
encoding each of the plurality of digital watermarks in the digital signal at substantially the same encoding level.	See Figure 6 adder/subtracter 212.
72. A method for pre-analyzing a digital signal for encoding digital watermarks using a digital filter, comprising:	Page 129 lines 27-31.
reading a digital signal;	Page 129 line 28.
providing a digital filter to be applied to the digital signal; and	Page 130 lines 2-7.
identifying an area of the digital signal that will be affected by the digital filter based on at least one measurable difference between the digital signal and a counterpart of the digital signal selected from the group consisting of the digital signal as transmitted, the digital signal as stored in a medium, and the digital signal as played backed.	Page 129 lines 27-31 and page 130 lines 2-7.
73. A method for encoding a watermark in a content signal, comprising:	See page 6 line 19 - page 9 line 18.

splitting a watermark bit stream; and encoding at least half of the watermark bit stream in the content signal using offsetting instances of the watermark bit stream.	Page 16 line 22 - page 17 line 7. Page 7 line 27 - page 8 line 2.
74. A method for encoding at least one watermark in a content signal, comprising: predetermining a number of bits in the content signal to be encoded, based on at least one of a fixed length key and signal characteristics of the content signal; and encoding the watermark in the predetermined bits.	See page 6 line 19 - page 9 line 18. Page 45 line 11 - page 46 line 3. Page 7 line 27 - page 8 line 2.
75. A method for encoding at least one watermark in a content signal, comprising: locating at least one noise-like signal feature in the content signal; and encoding the at least one watermark in substantially the same location as the at least one noise-like signal feature.	Page 127 line 10 – page 12 page 130 line 12 address perceptually adaptive signing. Page 128 lines 3-13. Page 128 lines 3-13.
76. A method for encoding at least one digital watermark in a content signal comprising: measuring a perceived signal-to-error ratio; and encoding the at least one watermark in a channel bound by a minimum and maximum signal-to-error level for the content signal.	Page 5 lines 22-29. Page 7 lines 9-14. Page 7 lines 9-14.
77. A method for digital watermark encode/decode comprising the step[s] of: measuring a perceived signal-to-error ratio; and encoding at least one watermark in a signal feature that is bound by a minimum and maximum signal-to-error level for the digital signal.	Page 5 lines 22-29. Page 7 lines 9-14. Page 126 line 13 – page 127 line 7.
78. A method for digital watermark decode comprising:	Page 8 line 3 – page 9 line 18.

receiving a suspect digital signal to be analyzed;	Page 8 lines 13-20.
subjecting the digital signal to a time-based alignment;	Page 25 lines 22-26.
using the time-based alignment to align amplitude values in the suspect digital signal; and	Page 25 lines 22-26.
decoding a digital watermark.	Page 8 lines 27-31 and page 9 lines 4-18.
79. A method for encoding watermarks in a digital content signal, comprising:	Page 74 line 5 - page 75 line 2.
identifying a plurality of signal features in the digital content signal; and	Figures 21A and 21B and page 74 lines 19-25.
inserting watermark data in the identified signal features;	Page 74 lines 14-18.
wherein the identified signal features are identified from relationships between multiple sample windows in the digital content signal.	Figures 21A and 21B and page 74 lines 19-25.
80. The method of claim 79, wherein the signal features have logical relationships with an analog waveform represented by the digital content signal.	Page 74 lines 8-13.
81. The method of claim 79, wherein the signal features comprise mathematical functions of the sample windows.	Page 74 line 5 - page 75 line 2; and page 26 line 27- page 27 line 2.
82. A method for decoding watermarks from a digital content signal, comprising:	See page 8 line 13 - page 9 line18.
identifying a plurality of signal features in the digital content signal; and	Page 74 line 5 - page 75 line 2.
decoding watermark data from the signal features;	See page 8 line 13 - page 9 line18 and page 74 line 5 - page 75 line 2.
wherein the signal features are identified from relationships between multiple sample windows in the digital content signal.	Figures 21A and 21B and page 74 lines 19-25.
83. The method of claim 82, wherein the signal features have logical relationships with an analog waveform represented by the	Page 74 lines 8-13.

digital content signal.	
84. The method of claim 82, wherein the signal features comprise mathematical functions of the sample windows.	74 line 5 - page 75 line 2.
85. A method for pre-analyzing a digital signal for encoding digital watermarks using a digital filter comprising: identifying at least one of a frequency and a time delimited area of the digital signal that will be affected by the digital filter; and encoding at least one digital watermark so as to avoid the identified area.	Page 129 lines 27-31. Page 32 lines 12 and 13. Page 129 lines 27-31 and page 32 lines 3-13.
86. A method for pre-analyzing a digital signal for encoding digital watermarks using a digital filter, comprising: identifying at least one change to the digital signal that will be affected by the digital filter; and encoding at least one digital watermark so the watermark survives the changes introduced by the digital filter.	Page 54 line 4 – page 58 line 10. Page 54 lines 4-6. Page 57 line 17 – page 58 line 10.
87. A method for guaranteeing watermark uniqueness, comprising: providing a watermark; and attaching a timestamp.	Page 33 lines 14-20. Page 33 lines 14-20. Page 33 lines 14-20.
88. A method for guaranteeing watermark uniqueness, comprising: providing a watermark; and attaching a user identification dependent hash to the watermark.	Page 116 lines 13-23. Page 116 lines 13-23. Page 116lines 13-23.
89. A method for guaranteeing watermark uniqueness, comprising: providing a watermark; and attaching a message digest of watermark data.	Page 61 lines 2-17. Page 61 lines 2-17. Page 61 lines 2-17.
90. A system for digital watermark	Figure 6 and page 127 line 10 – page 130

encode/decode operations, comprising: a parameter database comprising a plurality of parameters; and a processor which encodes at least one watermark using at least one parameter from the parameter database.	line 12. Page 129 lines 10-13 and page 130 lines 8-12. Figure 6 element 212.
91. A method for digital watermark encode/decode comprising: providing a digital signal stream; Using one or more of a plurality of watermarking parameters to encode at least one digital watermark; and associating the one or more of a plurality of watermarking parameters with a predetermined key.	Figure 6 and page 46 line 22 – page 47 line 9. See input 218 of Figure 6. Page 46 lines 29 and 30. Page 47 lines 6-9.
92. An article of manufacture comprising: a receiver to receive a digital signal; a detector to detect at least two of a plurality of digital watermarks located within the digital signal; and a processor that enables content signal manipulation of the digital signal based on successful detection of at least two of the plurality of digital watermarks.	Figure 6 and page 46 line 22 – page 47 line 9. Figure 6 element 218. Page 47 lines 2-9 and Figure 6. Page 47 lines 2-9 and Figure 6.
93. The article of claim 92, wherein the detector also detects a watermark, further comprising: a verification module which verifies at least one detected watermark.	 Page 47 lines 6-9.
94. A method for pre-processing a digital data signal to authorize a plurality of unique descendant copies of the digital data signal, comprising: providing the digital data signal; identifying a plurality of candidate bits	Figure 7 and page 30 line 28 – page 31 line 9. See Figure 7. See page 127 line 10 – page 130 line 13 re

in the digital data signal that can be manipulated during embedding; generating a digital watermark message to be embedded based on at least one predetermined criterion; and embedding the digital watermark message in the plurality of candidate bits.	perceptually adaptive signing. Page 30 line 28 – page 31 line 9. See real time encoder 202 in Figure 7.
95. The method of claim 94, wherein the step of identifying candidate bits of the digital data signal to be manipulated comprises: generating a psychoacoustic model of the digital data signal.	See equations (1) and (2) on page 10 and page 28 lines 20-31.
96. The method of claim 94, wherein the step of identifying candidate bits of the digital data signal to be manipulated comprises: generating a psychovisual model of the digital data signal.	See page 127 line 10 – page 130 line 13 re perceptually adaptive signing.
97. The method of claim 94, wherein the digital data signal comprises compressed digital data.	See page 46 lines 6-18.
98. The method of claim 94, wherein the step of generating a digital watermark message comprises: generating a unique digital watermark message for each authorized descendant copy.	See page 30 line 28 – page 31 line 9.
99. The method of claim 94, wherein the criterion are selected from the group consisting of a transaction identification, an individual identification, a use limitation, and a signal domain.	Page 5 lines 22-29 , page 30 line 28 – page 31 line 9, and page 37 lines 2-23.
100. The method of claim 94, wherein the digital watermark message is encoded in a subset of the plurality of candidate bits identified.	Page 32 lines 12-16.
101. The method of claim 94, wherein the plurality of candidate bits that are embedded with the digital watermark message have a relationship that creates additional uniqueness of the digital watermark message.	Page 45 line 25 - page 46 line 3.
102. The method of claim 101, wherein the relationship is at least one of a sequential relationship, a linear relationship, and a	See page 45 line 25 - page 46 line 3.

logically-ordered relationship.	
103. The method of claim 94, wherein a subset of the plurality of the candidate bits share at least one function.	Page 125 lines 19-22.
104. The method of claim 103, wherein the function is selected from the group consisting of mapping, error correction, and signal processing.	See page 23 lines 13-17, and page 125 lines 19-22.
105. The method of claim 94 further comprising: selectively adding noise to the digital data signal.	 Page 32 lines 12-16.
106. A method for pre-processing a digital data signal to steganographically encode unique copies of the digital data signal, comprising: providing a digital data signal; identifying candidate bits of the digital data signal that will be steganographically encoded; generating a key on at least one predetermined criterion; and manipulating the digital data signal at the plurality of candidate bits with the key.	Page 30 line 15 – page 31 line 9 and page 49 line 26- page 50 line 5. See Figure 7. Page 32 lines 12-16. Page 49 lines 29-31. See Figure 13.
107. The method of claim 106, wherein the step of identifying candidate bits of the digital data signal to be manipulated comprises: generating a psychoacoustic model of the digital data signal.	 See equations (1) and (2) on page 10 and page 28 lines 20-31.
108. The method of claim 106, wherein the step of identifying candidate bits of the digital data signal to be manipulated comprises: generating a psychovisual model of the digital data signal.	 See page 127 line 10 – page 130 line 13 re perceptually adaptive signing.
109. The method of claim 106, wherein the step of providing a digital data signal comprises providing a digital data signal comprised of compressed digital data.	See page 46 lines 6-18.
110. The method of claim 106, wherein the step of generating a scrambling key	

comprises: generating a unique scrambling key for each authorized copy.	 Figure 7 and page 30 line 28 – page 31 line 9.
111. The method of claim 106, wherein the criterion are selected from the group consisting of a transaction identification, an individual identification, a use limitation, and a signal domain.	Page 5 lines 22-29, page 30 line 28 – page 31 line 9, and page 37 lines 2-23.
112. The method of claim 106, wherein a subset of the plurality of candidate bits identified are manipulated with the key.	Page 32 lines 12-16.
113. The method of claim 106, wherein the step of manipulating the digital data signal at the plurality of candidate bits with the scrambling key comprises: manipulating the plurality of candidate bits with a key to embed a watermark and to add noise to digital signal.	 See Figure 13.
114. The method of claim 113, wherein the relationship is at least one of a sequential relationship, a linear relationship, and a logically-ordered relationship.	See page 45 line 25 - page 46 line 3.
115. The method of claim 106, wherein a subset of the plurality of the candidate bits are selected based upon their ability to survive a predetermined test of robustness.	Page 127 line 10 – page 130 line 12, and page 32 lines 12-16.
116. The method of claim 115, wherein the function is selected from the group consisting of mapping, error correction, and signal processing.	See page 23 lines 13-17, and page 125 lines 19-22.
117. A method for creating a copy of a digital data signal, comprising: obtaining a model for the digital data signal; and generating a watermark for the descendant copy of the digital data signal based on at least one criterion.	Page 9 line 21 – page 12 line 31. See equations (1) and (2) on page 10. Page 10 lines 26-30.
118. The method of claim 117, wherein the step of obtaining a model of the digital data signal comprises: generating the psychoacoustic model for the digital data signal.	 See equations (1) and (2) on page 10 and page 28 lines 20-31.

119. The method of claim 117, wherein the step of obtaining a model of the digital data signal comprises: retrieving a stored psychoacoustic model for the digital data signal.	 See equations (1) and (2) on page 10 and page 28 lines 20-31.
120. The method of claim 117, wherein the step of obtaining a model of the digital data signal comprises: generating the psychovisual model for the digital data signal.	 See page 127 line 10 – page 130 line 13 re perceptually adaptive signing.
121. The method of claim 117, wherein the step of obtaining a model of the digital data signal comprises: retrieving a stored psychovisual model for the digital data signal.	 See page 127 line 10 – page 130 line 13 re perceptually adaptive signing and page 130 lines 8-12.
122. The method of claim 117, wherein the criterion are selected from the group consisting of a transaction identification, an individual identification, a use limitation, and a signal domain.	Page 5 lines 22-29, page 30 line 28 – page 31 line 9, and page 37 lines 2-23.
123. A method for pre-processing a digital data signal, comprising: providing a digital signal; identifying a plurality of candidate bits in the digital data signal that can be manipulated during embedding; generating at least one digital watermark message to be embedded based on at least one predetermined criterion; selecting candidate bits to manipulate; and embedding the at least one digital watermark message in the selected candidate bits.	Page 9 line 21 – page 12 line 31. See page 9 lines 25-29. See page 127 line 10 – page 130 line 13 re perceptually adaptive signing. Page 10 lines 26-30. Page 32 lines 12-16. See page 11 line 8 – page 12 line 31.
124. The method of claim 123, wherein the at least one predetermined criterion includes at least one characteristic of the digital signal.	Page 10 lines 26-30.
125. The method of claim 123, wherein	

the step of selecting candidate bits to manipulate comprises: selecting candidate bits that provide optimal locations for the digital watermark.	See page 127 line 10 – page 130 line 13 re perceptually adaptive signing.
126. The method of claim 123, further comprising the step of: inverting at least one watermark out of a plurality of embedded watermarks.	Page 16 line 22 - page 17 line 7.
127. The method of claim 123, further comprising the step of: decoding the at least one digital watermark from the digital data signal.	See page 8 line 13 – page 9 line 18.
128. The method of claim 127, wherein the step of decoding the at least one digital watermark from the digital data signal comprises: degrading the watermarked digital data signal responsive to an unauthorized attempt to decode the digital watermark form the digital data signal.	Page 34 line 25 - page 35 line 12, and page 73 line 24 – page 74 line 2.
129. The method of claim 127, wherein the step of decoding the at least one digital watermark from the digital data signal comprises: degrading the watermarked digital signal responsive to fewer than all embedded watermarks being decoded from the digital signal.	Page 34 line 25 - page 35 line 12, and page 73 line 24 – page 74 line 2.
130. The method of claim 127, wherein the step of decoding the at least one digital watermark from the digital data signal is asymmetric.	See Figure 13.
131. The method of claim 123, wherein a key corresponding each of the at least one watermark comprises a greater number of bits than the corresponding watermark message.	Page 121 lines 26-28.
132. The method of claim 123, wherein a key corresponding each of the at least one watermark comprises the same greater number of bits as the corresponding watermark message.	Page 121 lines 26-28.

133. A method for pre-processing a digital data signal to authorize a plurality of unique descendant copies of the digital data signal, comprising:	See Figure 13 and page 48 line 7 – page 50 line 26.
providing a digital data signal;	See Figure 13, frame 12183 and page 48 line 18.
identifying candidate bits of the digital data signal that will be manipulated during scrambling;	e.g., Frame 12183.
generating a key on at least one predetermined criterion; and	Page 49 lines 26-31.
manipulating the digital data signal at the plurality of candidate bits with the scrambling key.	Page 48 line 30 – page 49 line 2 .

Respectfully submitted,

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